more benefits to those consumers than for the other segments where competition is relatively stronger.

V. BELLSOUTH HAS THE POTENTIAL TO HAVE LOW INCREMENTAL COSTS

29. There are functions for which economies of scope would potentially strengthen BellSouth's prospects for success when it enters the interexchange market. These economies might enable it to challenge the Big Three interexchange carriers more effectively than small carriers and resellers have to date. Absent legal and regulatory restrictions, such potential economies exist for at least the following functions:

- Certain transmission facilities
- Sales and marketing
- Customer care
- Billing.

Such economies of scope could conserve on the economy's scarce resources and benefit consumers. Nevertheless, Section 272 of the Telecommunications Act and the FCC rules implementing the Act require BellSouth to operate largely as a separate, arms-length subsidiary for at least three years; and the FCC could extend the requirement beyond that period. Thus, the principal permissible joint activities are sales, sales support systems, and customer support. The separate subsidiary restriction may tend to postpone the time when competitive forces will determine whether vertically integrated or non-vertically integrated carriers are the most effective and efficient means of serving customers.

VI. BELLSOUTH'S MARKET POSITION

30. There is evidence about the market credibility of local exchange carriers such as BellSouth. C/J Research conducted a survey in January, 1996. The survey called Comm-Trac asked residence customers about their satisfaction with companies providing long-distance service, local telephone service, cellular service, and cable TV service. The most relevant data compare customers' opinions of the current long-distance companies with local exchange

carriers. The survey found that local exchange carriers met or exceeded expectations for 85.4 percent of respondents, whereas long distance carriers did so for 91.1 percent. To put these figures in perspective, cable TV companies met or exceeded expectations for only 67.3 percent of respondents. Thus, although satisfaction with the long distance carriers is slightly higher than it is with local exchange carriers, satisfaction with both is high, and the difference in satisfaction between long distance carriers and local carriers is small relative to the difference in satisfaction between either of these types of carriers and the cable companies. The survey also asked respondents whether they would change their carrier when a new company begins offering service. The result is that 12.8 percent of residence customers say they would either definitely or probably switch long-distance carrier, while 15.6 percent say they would definitely or probably switch local exchange carrier. This small difference between the two markets contrasts with the large difference between either of those two markets and the cable TV market: for the latter market 37.0 percent said that they would definitely or probably switch.

31. The Yankee Group conducted a similar study among consumers and found similar levels of satisfaction with the three kinds of carriers as the Comm-Trac survey did. The Yankee Group found that 89 percent of consumers rated the services of long distance carriers as good or excellent; 85 percent of them rated local exchange carrier services at that level; and just 61 percent rated the services of cable TV companies at that level.[33] The data indicate high satisfaction with local exchange carriers in general as service providers. The Yankee Group updated its study in 1996, and the update shows results for individual RBOCs. To help add to the information from the previous Yankee Group study, Table 4 reports results for more detailed questions; I show the percentage of customers who rate a carrier as excellent; and I compare ratings of BellSouth with interexchange carriers and cable companies:[34]

[33] The Yankee Group, "IXCs versus RBOCs: The Battle of the Century" (December, 1995), p. 33. The report als finds ratings of 76 percent for electric companies and 70 percent for cellular carriers.

[34] The Yankee Group, "The 1996 TAF Survey: Implications for Convergence" (1996), p.14; also detailed data obtained directly from The Yankee Group.

Table 4
Percentage of Households Rating Carrier as Excellent

Subject	BellSouth	Interexchange Carriers	Cable TV
Professional and Courteous Personnel	26.6	25.2	11.5
Accurate and Easy-to-Understand Bills	27.0	25.5	15.6
Timely Resolution of Problems	26.6	22.1	11.2
Quick Access to Customer Service	23.4	21.0	10.5
Value for the Money	15.5	18.3	6.3
High-Quality Transmission	21.7	26.2	8.3
Trustworthiness	22.7	24.4	8.7
Deserving of Loyalty	22.7	23.4	7.5

For most measures, BellSouth's ratings are close to those of the interexchange carriers, and some even exceed those of the interexchange carriers. Again, the cable TV companies lag far behind.

32. A survey by IDC/LINK yields similar information. In its 1995 Home Media Consumer Survey, the research firm asked U.S. households to rate their long distance company, local telephone company, and cable TV company.[35] Table 5 shows the results for BellSouth and interexchange carriers:

Table 5
Percentage of Households Rating Carrier as Very Good or Good

Subject	BellSouth	Interexchange Carriers
Customer Service	76	80
Service Reliability and Product Quality	77	81

33. Again, the differences between BellSouth and long distance carriers is small. If the difference were large, then one would have substantial concerns about BellSouth's entry prospects. But such small differences in percentages generally imply that there is a large

[35] IDC/LINK reports selected results in Rona Shuchat, "Brand Awareness: The Critical Key to Success," IDC/LINK #11179, Volume 1, Tab 1 Market Analysis (March 1996), p. 8. IDC/LINK provided the detailed data directly.

customer segment which rates BellSouth as well as or better than the interexchange carriers; further, such a small difference in percentages can be overcome by reasonably diligent efforts.

34. The FCC also collects data which enable comparisons among individual local exchange carriers.[36] According to the FCC data obtained from the carriers, customer satisfaction with BellSouth has tended to be better than for the other Bell companies as a whole in recent years. For residence customers, from 1H91 through 1H95 (the most recent period with data in the FCC report) the percentage of customers satisfied has exceeded that of the Bell average for five out of nine semiannual periods and has equaled the average in one period. During that four and a half years as a whole, an average of 94.4 percent of BellSouth residence customers were satisfied, as compared with 93.5 percent for the Bell companies in total. The percentage of BellSouth small business customers who were satisfied averaged 94.5 compared with 93.0 for the Bell companies as a whole.[37]

35. Since divestiture, the RBOCs have developed marketing and competitive skills that were inadequate prior to divestiture. The RBOCs have honed their competitive skills in a variety of markets that have become competitive or that were competitive early on. Such markets include customer premises equipment, cellular service, certain vertical services, Centrex service, inside wiring installation and maintenance, Yellow Pages, billing and collection services offered to interexchange carriers, and, more recently, intraLATA toll service.

36. Staffing heavily from BellSouth and other telecommunications firms, BellSouth's long distance affiliate will obviously be thoroughly experienced in the telecommunications industry,

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[36] Jonathan M. Kraushaar, "Update on Quality of Service for the Local Operating Companies Aggregated to the Holding Company Level," Common Carrier Bureau—Industry Analysis Division, Federal Communications Commission (March, 1996). The report cautions that some of the data might not be fully consistent among companies or over time for a given company. The FCC aggregates operating-company data to the holding company level using an unweighted average of operating-company data. The FCC report does not cover non-Bell companies.

[37] The FCC report also shows data for large business customers; however, the data are not available for all companies for all years. The FCC reports an RBOC average only through the first half of 1993. Satisfaction of BellSouth's large business customers equaled or exceeded the RBOC average for four out of five semiannual periods from 1H91 through 1H93.

its market needs, its operational requirements, its technologies, and its equipment suppliers. In particular, its employees will have experience in the toll market because BellSouth had already been providing intraLATA toll services.

37. When entering the interLATA market, BellSouth might position itself as a low-priced carrier. It might instead differentiate itself by providing superior customer service, quality, or distinctive services. Either way, this additional competition would force the incumbents to respond in kind or by making their offerings more attractive in innovative new ways. Whatever the competitive response, customers—both business and residence—would benefit.

VII. CARRIER ACCESS RATES ABOVE COSTS WILL NOT HARM COMPETITION

38. I leave to other affiants most of the discussion of whether competition and regulatory safeguards are sufficient to protect the interexchange market from anticompetitive abuses. One topic, however, I will address because I have written on the subject and because I have frequently seen erroneous claims regarding it. All parties—myself included—agree that current rates for carrier access are above the cost of providing the service. This differential has helped to keep rates lower for other services—in particular, residence basic service. The incumbent interexchange carriers and others have claimed that this differential would give a local exchange carrier (LEC) an artificial cost advantage that would cause it to discriminate against competitors and expand its long distance output at the expense of competitors. There are two versions of this claim, the simple version and the subtle version, so I deal with each version in turn.

39. First consider the simple version of the claim. According to this version, to maximize overall corporate profits, the LEC's long distance affiliate would choose a price level using the true economic cost of carrier access in its calculations rather than the tariff price of carrier access that the incumbent interexchange carriers must pay. As the argument goes, the affiliate could profitably take customers away from its competitors even if it were less efficient than its competitors.

40. This naïve argument is flat-out wrong. Think about what happens if the long distance affiliate were to take, say, 100 minutes away from a competitor. The LEC would no longer

receive carrier access revenues from that competitor. If access charges were, say, 6 cents per minute, then the LEC would forego $6.00 in access revenues. To maximize profits, the LEC corporate parent must recognize that $6.00 in lost access revenues as an opportunity cost of having its long distance affiliate carry the 100 minutes. If the affiliate cannot earn enough revenue to cover both its own costs and the opportunity cost of access, then its taking the 100 minutes away from the competitor would be unprofitable for the LEC corporate parent.

41. Consider a simple example. For illustration, assume the following:

- the price of carrier access is 6 cents per minute,
- the LEC's incremental cost of access is 1 cent per minute,[38]
- the market price of long distance service is 16 cents per minute, and
- the incremental cost of both the LEC's long distance affiliate and the incumbent IXCs is 10 cents per minute.

42. Let us look at the problem from an accounting point of view. Consider Scenario 1: An incumbent interexchange carrier carries 100 minutes. In that case, the LEC's access revenues are $6.00, its incremental access costs are $1.00, and it earns no profits in the long distance market, so its total corporate profits are $5.00.

43. Now consider Scenario 2: the LEC's long distance affiliate carries that 100 minutes instead. The LEC no longer earns those access revenues from the incumbent interexchange carriers. The only revenues to account for are the long distance affiliate's revenues of $16.00 (100 minutes times the price of 16 cents per minute). We have to account for two sources of costs. First, the LEC's long distance affiliate bears a cost of $10 (100 minutes times its incremental cost of 10 cents per minute). Second, the LEC bears a cost of providing access of $1.00 (100 minutes times an incremental cost of one cent a minute). For the LEC corporation as a whole, its profits are the long distance revenues of $16.00 minus long distance costs of

[38] For simplicity of the illustration, I assume here that there are no economies of scope between the LEC's provision of carrier access service to its long distance affiliate and the affiliate's provision of long distance service. There might indeed be such economies of scope.

$10.00 minus access costs of $1.00; *i.e.*, its total corporate profits are $5.00—precisely the same amount as it earned in Scenario 1, when the incumbent interexchange carrier carried the 100 minutes. To summarize, the LEC corporate profits in the two scenarios and the difference in profits are as follows:

Table 6
Illustration Showing LEC's Lack of Profit Incentive to Discriminate

	Incumbent IXC Carries	LEC LD Affiliate Carries	Change in Profit
Long distance revenue	$ 0.00	$16.00	$16.00
Long distance costs (neg.)	$ 0.00	($10.00)	($10.00)
Access revenue	$ 6.00	$ 0.00	($ 6.00)
Access costs (neg.)	($ 1.00)	($ 1.00)	$ 0.00
Total	$5.00	$ 5.00	$ 0.00

As you can see, the LEC corporation as a whole makes exactly the same profit in the two scenarios. Therefore, the naïve claim about access charges is wrong. The LEC corporation as a whole does not increase profit by taking business away from an equally-efficient competing interexchange carrier.

44. In that simple illustration I pretended that the long distance market is highly competitive, so the market price equals the sum of the price of access and the cost of long distance. If the long distance market is not fully competitive, as it appears not to be, then the market price would exceed the costs of the incumbent interexchange carriers. In that case, the LEC corporation as a whole would make more profits if the LEC long distance affiliate were to carry the 100 minutes than if the incumbent interexchange carriers were to carry them. But that outcome results from the lack of competitiveness in the market, not from a price of access that exceeds its incremental costs. The LEC long distance affiliate, making its own decisions and taking its carrier access bills as a cost, would make the same decisions about whether to carry traffic as the LEC corporate CEO would have made.

45. Now consider the more subtle argument, according to which the LEC would increase its profits if its long distance affiliate could somehow cause the market price of long distance services to fall and thereby stimulate demand for the LEC's carrier access services. That outcome is not a problem, since it improves economic welfare, driving prices closer to economic costs.

46. Professor Franklin Fisher, however, raised the concern that a LEC and its long distance affiliate (an "integrated LEC") would behave differently from an unintegrated provider and might expand output even if it were less efficient than its rivals.[39] The potential for an economic problem in this theory arises because the gain in economic welfare from driving long distance prices closer to economic costs might be exceeded by the increase in industry costs. If so, there theoretically could be a loss of economic efficiency. However, as my co-authors and I pointed out in a recent paper,[40] such losses would be outweighed by efficiency gains from the expansion of industry output as long distance prices are driven closer to economic costs. We found conclusively that, for a wide range of reasonable assumptions, the entry of a vertically integrated LEC would cause an increase in consumer plus producer surplus, even if it were less efficient than its rivals.[41] The economic welfare gain is larger if the vertically-integrated LEC maximizes total corporate profits—taking into account the additional contribution the corporation receives from expanded carrier access demand—than if the LEC's long distance affiliate maximizes only its own profits.

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[39] Franklin M. Fisher, "An Analysis of Switched Access Pricing and the Telecommunications Act of 1996."

[40] Richard L. Schmalensee, William E. Taylor, J. Douglas Zona, and Paul J. Hinton, "An Analysis of the Welfare Effects of Long Distance Market Entry by an Integrated Access and Long Distance Provider," CC Docket 96-262 *et al.*, on behalf of USTA, *ex parte* filed March 7, 1997.

[41] We estimated that entry by a vertically-integrated LEC, maximizing total corporate profits, would increase net consumer plus producer surplus by $0.80 per line per month. There are about 100 million residence lines in the U.S.; thus, on a national basis, that represents a welfare gain for residence customers alone of about $1 billion a year. Even under an extreme assumption that the LEC's long distance affiliate might be 20 percent less efficient than the incumbent interexchange carriers, the welfare gain still exceeds $0.60 per line per month. After completing the article, I also found through subsequent research that the conclusions are robust with respect to changes in the technical behavior assumptions of the LEC—whether the LEC assumes that its output decisions do not affect the outputs of competitors or whether it anticipates and takes into account rival output changes responding to its own actions.

47. Thus, our model shows that, under plausible assumptions, Professor Fisher is half right—the incremental profits in long distance and carrier access cause an integrated firm to select a different level of output from what an unintegrated firm would select. However, Professor Fisher is wrong in his conjecture that this leads to losses in economic efficiency.

48. Our results are consistent with the findings of Sibley and Weisman.[42] Using a simple model of the long-distance market, they find that combined profit-maximizing behavior of the LECs in a substantial range of circumstances gives them the incentive to reduce rather than raise their rivals' costs. In sum, the entry of an integrated LEC into the long distance market is procompetitive for reasonable ranges of parameter values.

VIII. CONCLUSIONS

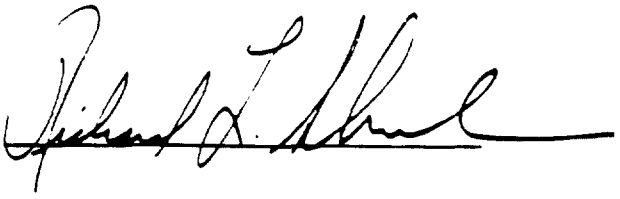
49. As we have seen, current long distance competition for the consumer segment is inadequate, and the interexchange carriers have increased rates for this segment. Entry by a strong competitor could break down the pricing discipline that the Big Three have succeeded in maintaining in recent years. BellSouth has a good market position to expand its service offerings to include interexchange services. After expiration of the separate-subsidiary restrictions established by the Act and implemented by the FCC order in Docket 96-149, it will be helped by additional economies of scope.

50. At least one economy of scope will be realizable immediately, even under the separate-subsidiary requirement—the benefit of the existing BellSouth brand name. As explained in Section VI, through its high-quality service and advertising, BellSouth has achieved considerable customer recognition, loyalty, and trust. Many customers might have hesitated to buy their interexchange service from a "no-name" carrier. (I do not intend to disparage the small interexchange carriers but rather to indicate how a customer, unfamiliar with the quality and value of such a carrier's services, might tend to perceive them.) In contrast, most of BellSouth's

[42] David S. Sibley and Dennis L. Weisman, "The Competitive Incentives of Vertically Integrated Local Exchange Carriers: An Economic and Policy Analysis," *Journal of Policy Analysis and Management*, forthcoming Vol. 17, No. 1, 1997.

customers are familiar with the BellSouth brand name and have a favorable opinion about the company's quality of service and value. Thus, on this basis at least, BellSouth might be able to offer an effective competitive challenge to existing interexchange carriers even if it were to enter the long distance market as a pure reseller. In addition, BellSouth is large (although not nearly as large as AT&T or MCI); it has substantial positive cash flows; it has healthy relations with the stock, bond, and banking markets; and its securities are rated as low risk. Thus, it is in a good position to fund necessary construction and entry start-up costs. For all the above reasons, BellSouth is a credible competitor in the long distance market and so has good prospects for intensifying competition in that market. Such an intensification of competition would benefit consumers and would be in the public interest. Current carrier access charges, set above costs, are not a threat to those consumer benefits.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 18, 1997.



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National Research Council, Transportation Research Board, Committee for the Study of Transportation and a Sustainable Environment, 1994-
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Revista de Análisis Económico Lecture, Econometric Society Latin American Meeting, 1994
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BOOKS WRITTEN:

The Economics of Advertising (Vol. 80, Contributions to Economic Analysis), Amsterdam: North-Holland, 1972.

Applied Microeconomics: Problems in Estimation, Forecasting and Decision-Making, San Francisco: Holden-Day, 1973.

An Introduction to Applied Macroeconomics (with E. Kuh), Amsterdam: North-Holland, 1973. Japanese Edition, Tokyo: McGraw-Hill Kogakusha, 1975.

The Control of Natural Monopolies, Lexington: D.C. Heath (Lexington Books), 1979.

Markets for Power: An Analysis of Electric Utility Deregulation (with P. L. Joskow), Cambridge: MIT Press, 1983.

Economics, 2nd Edition (with S. Fischer and R. Dornbusch), New York: McGraw-Hill, 1988.

BOOKS EDITED:

The Empirical Renaissance in Industrial Economics (co-editor, with T. F. Bresnahan), Oxford: Basil Blackwell, 1987.

Handbook of Industrial Organization (co-editor, with R. D. Willig), Amsterdam: North-Holland, 1989.

JOURNAL ARTICLES:

"Regulation and the Durability of Goods." *Bell Journal of Economics and Management Science*, Vol. 1 (Spring 1970), pp. 54-64.

"Consumer's Surplus and Producer's Goods." *American Economic Review*, Vol. 61 (September 1971), pp. 682-687.

"A Note on Monopolistic Competition and Excess Capacity." *Journal of Political Economy*, Vol. 86 (May/June 1972), pp. 586-591.

"Option Demand and Consumer's Surplus: Valuing Price Changes Under Uncertainty." *American Economic Review*, Vol. 62 (December 1972), pp. 813-824.

"A Note on the Theory of Vertical Integration." *Journal of Political Economy*, Vol. 81 (March/April 1973), pp. 442-449.

"Brand Loyalty and Barriers to Entry." *Southern Economic Journal*, Vol. 40 (April 1974), pp. 579-588.

"Market Structure, Durability, and Maintenance Effort." *Review of Economic Studies*, Vol. 41 (April 1974), pp. 277-287.

"Estimating the Costs and Benefits of Utility Regulation." *Quarterly Review of Economics and Business*, Vol. 14 (Summer 1974), pp. 51-64.

"Consumer Behavior versus Economic Theory." *Recherches Economiques de Louvain*, Vol. 40 (September 1974), pp. 261-276.

"Alternative Models of Bandit Selection." *Journal of Economic Theory*, Vol. 10 (June 1975), pp. 333-342.

"An Experimental Study of Expectation Formation." *Econometrica*, Vol. 44 (January 1976), pp. 17-41.

"Another Look at the Social Valuation of Input Price Changes." *American Economic Review*, Vol. 66 (March 1976), pp. 239-243.

"Resource Exploitation Theory and the Behavior of the Oil Cartel." *European Economic Review*, Vol. 7 (April 1976), pp. 257-279.

"Advertising and Profitability: Further Implications of the Null Hypothesis." *Journal of Industrial Economics*, Vol. 25 (September 1976), pp. 45-54.

"A Model of Promotional Competition in Oligopoly." *Review of Economic Studies*, Vol. 43 (October 1976), pp. 493-507.

"Is More Competition Necessarily Good?" *Industrial Organization Review*, Vol. 4 (1976), pp. 120-121.

"Public Investment Criteria, Insurance Markets, and Income Taxes." *Journal of Public Economics*, Vol. 6 (November 1976), pp. 425-445.

"Valuing Changes in Regulated Firms' Input Prices." *Southern Economic Journal*, Vol. 43 (January 1977), pp. 1346-1351.

"Using the H Index of Concentration with Published Data." *Review of Economics and Statistics*, Vol. 59 (May 1977), pp. 186-193.

"Comparative Static Properties of Regulated Airline Oligopolies." *Bell Journal of Economics*, Vol. 8 (Autumn 1977), pp. 565-576.

"Nonconvexity and Optimal Exhaustion of Renewable Resources" (with T. R. Lewis). *International Economic Review*, Vol. 18 (October 1977), pp. 535-552.

"Common Stock Volatility Expectations Implied by Option Premia" (with R. R. Trippi). *Journal of Finance*, Vol. 33 (March 1978), pp. 129-147.

"A Note on Economies of Scale and Natural Monopoly in the Distribution of Public Utility Services." *Bell Journal of Economics*, Vol. 9 (Spring 1978), pp. 270-276.

"A Model of Advertising and Product Quality." *Journal of Political Economy*, Vol. 87 (June 1978), pp. 485-504.

"Life-Cycle Costing for Consumers of Energy-Conserving Devices" (with S. S. Penner and M. R. Brambley). *Energy*, Vol. 3 (July/August 1978), pp. 415-419.

"Entry Deterrence in the Ready-to-Eat Breakfast Cereal Industry." *Bell Journal of Economics*, Vol. 9 (Autumn 1978), pp. 305-327. Also in *Market Strategy and Structure* (J.M.A. Gee and G. Norman, eds.), London: Harvester Wheatsheaf, 1992, pp. 84-111.

"Market Structure, Durability, and Quality: A Selective Survey." *Economic Inquiry*, Vol. 17 (April 1979), pp. 177-198.

"On the Use of Economic Models in Antitrust: The ReaLemon Case." *University of Pennsylvania Law Review*, Vol. 127 (April 1979), pp. 994-1050. Also in *Antitrust Law and Economics* (O. E. Williamson, Editor), Houston: Dame Publications, 1980, pp. 97-153.

"Nonconvexity and Optimal Harvesting Strategies for Renewable Resources" (with T. R. Lewis). *Canadian Journal of Economics*, Vol. 12 (November 1979), pp. 677-691.

"Appropriate Government Policy Toward Commercialization of New Energy Supply Technologies." *Energy Journal*, Vol. 1 (April 1980), pp. 1-40.

"Advertising and Aggregate Consumption: An Analysis of Causality" (with R. Ashley and C. W. J. Granger). *Econometrica*, Vol. 48 (July 1980), pp. 1149-1168.

"On Oligopolistic Markets for Nonrenewable Natural Resources" (with T. R. Lewis). *Quarterly Journal of Economics*, Vol. 95 (November 1980), pp. 475-491.

"Qualitative Asymptotic Synthesis in Simple Optimal Control Problems." *Economic Letters*, Vol. 5 (1980), pp. 349-352.

"Output and Welfare Implications of Monopolistic Third-Degree Price Discrimination." *American Economic Review*, Vol. 71 (March 1981), pp. 242-247.

"Risk and Return on Long-Lived Tangible Assets." *Journal of Financial Economics*, Vol. 9 (June 1981), pp. 185-205.

"Monopolistic Two-Part Pricing Arrangements." *Bell Journal of Economics*, Vol. 11 (Autumn 1981), pp. 445-466.

"Economies of Scale and Barriers to Entry." *Journal of Political Economy*, Vol. 89 (December 1981), pp. 1228-1238.

"Commodity Bundling by Single-Product Monopolies." *Journal of Law and Economics*, Vol. 25 (April 1982), pp. 67-71.

"Antitrust and the New Industrial Economics." *American Economic Review*, Vol. 72 (May 1982), pp. 24-28.

"Cartel Deception in Markets for Nonrenewable Resources" (with T. R. Lewis). *Bell Journal of Economics*, Vol. 13 (Spring 1982), pp. 263-271.

"Another Look at Market Power." *Harvard Law Review*, Vol. 95 (June 1982), pp. 1789-1816.

"Product Differentiation Advantages of Pioneering Brands." *American Economic Review*, Vol. 72 (June 1982), pp. 349-365. ("Errata," *AER*, Vol. 73 (March 1983), p. 250).

"George Stigler's Contributions to Economics." *Scandinavian Journal of Economics*, Vol. 85 (March 1983), pp. 77-86.

"Advertising and Entry Deterrence: An Exploratory Model." *Journal of Political Economy*, Vol. 91 (August 1983), pp. 636-653.

"The Impact of Scale and Media Mix on Advertising Agency Costs" (with A. J. Silk and R. Bojanek). *Journal of Business*, Vol. 56 (October 1983), pp. 453-475.

"Gaussian Demand and Commodity Bundling." *Journal of Business*, Vol. 57 (January 1984), pp. S211-S230.

"Estimating Effective Concentration in Deregulated Wholesale Electricity Markets" (with B. W. Golub). *RAND Journal of Economics*, Vol. 15 (Spring 1984), pp. 12-26.

"Imperfect Information and the Equitability of Competitive Prices." *Quarterly Journal of Economics*, Vol. 99 (August 1984), pp. 441-460.

"Adversary Hydro Relicensing Applications: Using Economic Efficiency Criteria" (with P. L. Joskow). *Public Utilities Fortnightly*, Vol. 114 (20 December 1984), pp. 22-28.

"Econometric Diagnosis of Competitive Localization." *International Journal of Industrial Organization*, Vol. 3 (March 1985), pp. 57-70.

"Do Markets Differ Much?" *American Economic Review*, Vol. 75 (June 1985), pp. 341-351.

"Estimated Parameters as Independent Variables: An Application to the Costs of Electric Generating Units" (with P. L. Joskow). *Journal of Econometrics*, Vol. 31 (April 1986), pp. 275-305.

"Incentive Regulation for Electric Utilities" (with P. L. Joskow). *Yale Journal on Regulation*, Vol. 4 (F 1986), pp. 1-49.

"The Empirical Renaissance in Industrial Economics: An Overview" (with T. F. Bresnahan). *Journal of Industrial Economics*, Vol. 35 (June 1987), pp. 371-378.

"Collusion versus Differential Efficiency: Testing Alternative Hypotheses." *Journal of Industrial Economics*, Vol. 35 (June 1987), pp. 399-425.

"Ease of Entry: Has the Concept Been Too Readily Applied?" *Antitrust Law Journal*, Vol. 56 (1987), pp. 41-51.

"The Performance of Coal-Burning Electric Generating Units in the United States: 1960-1980" (with P. L. Joskow). *Journal of Applied Econometrics*, Vol. 2 (April 1987), pp. 85-109.

"Horizontal Merger Policy: Problems and Changes." *Journal of Economic Perspectives*, Vol. 1 (Fall 1987), pp. 41-54.

"Competitive Advantage and Collusive Optima." *International Journal of Industrial Organization*, Vol. 5 (December 1987), pp. 351-367.

"Industrial Economics: An Overview." *Economic Journal*, Vol. 98 (September 1988), pp. 643-681. Also in *Surveys in Economics*, Vol. 2 (A.J. Oswald, Editor), Oxford: Basil Blackwell, 1991, pp. 51-89.

"Perceptual Maps and the Optimal Location of New Products: An Integrative Essay." (with J.-F. Thisse). *International Journal of Research in Marketing*, Vol. 5 (1988), pp. 225-249.

"Intra-Industry Profitability Differences in U.S. Manufacturing: 1953-1983." *Journal of Industrial Economics*, Vol. 37 (June 1989), pp. 337-357.

"An Expository Note on Depreciation and Profitability under Rate-of-Return Regulation." *Journal of Regulatory Economics*, Vol. 1 (September 1989), pp. 293-298.

"Good Regulatory Regimes." *RAND Journal of Economics*, Vol. 20 (Autumn 1989), pp. 417-436.

"Continuity and Change in the Economics Industry." *Economic Journal*, Vol. 101 (January 1991), pp. 115-121. Also in *The Future of Economics* (J.D. Hey, ed.), Oxford: Basil Blackwell, 1992, pp. 115-121.

"Sunk Cost and Market Structure: A Review Article." *Journal of Industrial Economics*, Vol. 40 (June 1992), pp. 125-134.

"Comparing Greenhouse Gases for Policy Purposes." *Energy Journal*, Vol. 14 (1993), pp. 245-255.

"Symposium on Global Climate Change." *Journal of Economic Perspectives*, Vol. 7 (Fall 1993), pp. 3-10.

"Competition Policy in Russia During and After Privatization." (with P.L. Joskow and N. Tsukanova). *Brookings Papers on Economic Activity, Microeconomics*, 1994, pp. 301-374. [Awarded the 1995 Edward A. Hewett Prize by the American Association for the Advancement of Slavic Studies.]

"Economic Aspects of Payment Card Systems and Antitrust Policy Toward Joint Ventures" (with D.S. Evans). *Antitrust Law Journal*, 63 (Spring 1995), pp. 861-901.

"The Benefits of Releasing the Bell Companies from the Interexchange Restrictions." (with P.S. Brandon). *Managerial and Decision Economics*, 16 (July-August 1995), pp. 349-364.

"Privatization in Russia: What Should Be a Firm?" (with P.L. Joskow). *International Journal of the Economics of Business*, 2 (1995), pp. 297-327.

"What Have We Learned About Privatization and Regulatory Reform?" *Revista de Análisis Económico*, 10 (November 1995), pp. 21-39. (Remarks in Roundtable Discussion, pp. 303-312.)

"Is There a Role for Benefit-Cost Analysis in Environmental Health and Safety Regulation?" (with K.J. Arrow and nine others). *Science*, 272 (12 April 1996), pp. 221-222.

"The Political Economy of Market-Based Environmental Policy: The US Acid Rain Policy." (with P.L. Joskow). *Journal of Law and Economics*, forthcoming.

"World Carbon Dioxide Emissions: 1950-2050." (with T.M. Stoker and R.A. Judson). *Review of Economics and Statistics*, forthcoming.

CHAPTERS IN BOOKS:

"Advertising and Economic Welfare." In *Advertising and the Public Interest* (S. F. Divita, Editor), Chicago: American Marketing Association, 1974, pp. 82-97.

"Promoting Competition in Tomorrow's Markets for Solar Energy Systems." In *The Solar Market: Proceedings of the Symposium on Competition in the Solar Energy Industry*, U.S. Federal Trade Commission, Washington, D.C.: U.S. Government Printing Office, 1978, pp. 119-135.

"Cartel and Oligopoly Pricing of Nonreplenishable Natural Resources" (with T.R. Lewis). In *Dynamic Optimization and Mathematical Economics* (P. T. Liu, Editor), New York: Plenum, 1980, pp. 133-156.

"The New Industrial Organization and the Economic Analysis of Modern Markets." In *Advances in Economic Theory* (W. Hildenbrand, Editor), Cambridge: Cambridge University Press, 1982, pp. 253-285.

"Optimal Use of Renewable Resources with Nonconvexities in Production" (with T.R. Lewis). In *Essays in the Economics of Renewable Resources* (J. Mirman and D.F. Spulber, Editors), Amsterdam: North-Holland, 1982, pp. 95-111.

"Advertising and Market Structure." In *New Developments in the Analysis of Market Structure* (J. E. Stiglitz and G. F. Mathewson, Editors), Cambridge: MIT Press, 1986, pp. 373-396.

"Standards for Dominant Firm Conduct: What Can Economics Contribute?" In *The Economics of Market Dominance* (D. Hay and J. Vickers, Editors), Oxford: Basil Blackwell, 1987, pp. 61-88.

"Advertising." In *The New Palgrave*, Vol. 1 (J. Eatwell, M. Milgate, and P. Newman, Editors), New York: Macmillan, 1987, pp. 34-36.

"Industrial Organization." In *The New Palgrave*, Vol. 2 (J. Eatwell, M. Milgate, and P. Newman, Editors), New York: Macmillan, 1987, pp. 803-808.

"George Stigler's Contributions to Microeconomics and Industrial Organization." In *The New Palgrave*, Vol. 4 (J. Eatwell, M. Milgate, and P. Newman, Editors), New York: Macmillan, 1987, pp. 499-500.

"The Potential of Incentive Regulation." In *The Market for Energy* (D. Helm, J. Kay, and D. Thompson, Editors), Oxford: Clarendon Press, 1989, pp. 178-187.

"Inter-Industry Studies of Structure and Performance." In *Handbook of Industrial Organization*, Vol. 2 (R. Schmalensee and R. D. Willig, Editors), Amsterdam: North-Holland, 1989, pp. 951-1009.

"Empirical Models of Rivalrous Behavior." In *Industrial Structure in the New Industrial Economics* (G. Bonanno and D. Brandolini, Editors), Oxford: Oxford University Press, 1990, pp. 138-167.

"Economias del Tamaño Empresarial y Poder de Mercado" and "Innovación y Posición Competitiva." In *Concentración Empresarial y Competitividad: España en la C.E.E.* (Xavier Vives and Jordi Gual, Editors), Barcelona: Ariel Economia, 1990, pp. 55-67 and 119-131.

"Agreements Between Competitors." In *Antitrust, Innovation, and Competitiveness* (T. M. Jorde and D. J. Teece, Editors), Oxford: Oxford University Press, 1992, pp. 98-118.

"How Should We Address Economic Costs of Climate Change?" In *Global Climate Change: The Economic Costs of Mitigation and Adaptation* (J.C. White, ed.), New York: Elsevier, 1991, pp. 73-76.

"The Costs of Environmental Protection." In *Balancing Economic Growth and Environmental Goals*, Washington: American Council for Capital Formation Center for Policy Research, 1994, pp. 55-80. (Italian translation: "I costi della protezione abientale," *Energia*, Vol. 15 (December 1994), pp. 30-48.)

"What Does Stabilizing Greenhouse Gas Concentrations Mean?" (with H.D. Jacoby and D.M. Reiner). Forthcoming in an IPIECA conference volume on the economics of climate change.

OTHER PUBLICATIONS:

"The Computer Model of Energy Production without Fast Breeder Reactors" and "The Computer Model of Fast Breeder Demands and Prices" (with P. W. MacAvoy). Appendices E and F in *Economic Strategy for Developing Nuclear Breeder Reactors* by P. W. MacAvoy, Cambridge: MIT Press, 1969, pp. 186-199.

"Theory, Fact, and Policy: A Reply to Professor Barten." *Recherches Economiques de Louvain*, Vol. 41 (March 1975), pp. 63-66.

Measuring External Effects of Solid Waste Management (with R. Ramanthan, W. Ramm, and D. Smallwood). Washington, D.C.: U.S. Environmental Protection Agency, Socioeconomic Environmental Studies Series, 1975.

"Option Demand and Consumer's Surplus: Reply." *American Economic Review*, Vol. 65 (September 1975), pp. 737-739.

"Advertising, Concentration, and Profits: Comment." In *Issues in Advertising: The Economics of Persuasion* (D. C. Tuerck, Editor), Washington, D.C.: American Enterprise Institute, 1978, pp. 280-284.

"Remarks." In *The Conglomerate Corporation* (R. D. Blair and R. F. Lanzillotti, Editors), Cambridge: Oelgeschlager, Gunn & Hain, 1981, pp. 365-368.

"Income-Distributional Concerns in Regulatory Policymaking: Comment." In *Studies in Public Regulation* (G. Fromm, Editor), Cambridge: MIT Press, 1981, pp. 112-117.

"Comment on Beales, Craswell, and Salop." *Journal of Law and Economics*, Vol. 24 (December 1981), pp. 541-544.

Review of C. C. von Weizsacker, *Barriers to Entry*. *Journal of Economic Literature*, Vol. 21 (June 1983), pp. 562-564.

"Comments." In *Telecommunications Access and Public Policy* (A. Baughcum and G. R. Faulhaber, Editors), Norwood, N.J.: Ablex, 1984, pp. 76-80.

Review of D. J. Teece, ed., *The Competitive Challenge*. *Journal of Economic Literature*, Vol. 26 (December 1988), pp. 1779-1780.

"Regulation and Antitrust in the Bush Administration." *Antitrust Law Journal*, Vol. 58 (1989), pp. 475-480.

"Comment on Katz and Ordover." *Brookings Papers on Economic Activity: Microeconomics*, 1990, pp. 194-197.

"Commentary." In *Environmental Policy and the Cost of Capital*. Washington: American Council for Capital Formation Center for Policy Research, 1990, pp. 104-7.

"Comment on Mannering and Winston." *Brookings Papers on Economic Activity: Microeconomics*, 1991, pp. 107-110.

"A Comprehensive and Balanced Energy Policy." *Environmental Forum*, Vol. 8 (May/June 1991), pp. 41-42.

"Commentary." In *U.S. Environmental Policy and Economic Growth: How Do We Fare?* Washington: American Council for Capital Formation Center for Policy Research, 1992, pp. 48-51.

The Economics of the Payment Card Industry (with D.S. Evans). Cambridge: National Economic Research Associates, Inc., 1993.

Review of J. Broome, *Counting the Cost of Global Warming*; William R. Cline, *The Economics of Global Warming*; and Alan S. Manne and Richard G. Richels, *Buying Greenhouse Insurance: The Economic Costs of CO_2 Limits*. *Journal of Economic Literature*, Vol. 32 (June 1994), pp. 738-744.

"Green Costs and Benefits: The Buck Stops Where?" In *Environment Strategy America 1994/95* (W.K. Reilly, Editor), London: Campden, 1994, pp. 16-17.

Review of R. Wilson, *Nonlinear Pricing*. *Journal of Political Economy*, Vol. 102 (December 1994), pp. 1288-1291.

"Commentary." In *Strategies for Improving Environmental Policy and Increasing Economic Growth*, Washington: American Council for Capital Formation Center for Policy Research, 1995, pp. 32-35.

"A Guide to the Antitrust Economics of Networks" (with D.S. Evans). *Antitrust Magazine*, 10 (Spring 1996), pp. 36-40.

"Ways I Have Worked." *The American Economist*, 40 (Fall 1996), pp. 37-43. (Forthcoming in *Passion and Craft: How Economists Work* (M. Szenberg, ed.), Ann Arbor: University of Michigan Press.)

February, 1997

Appendix D

Declaration of Professor Jerry A. Hausman

1. I am MacDonald Professor of Economics at the Massachusetts Institute of Technology in Cambridge, Massachusetts, 02139.

2. I received an A.B. degree from Brown University and a B.Phil. and D. Phil. (Ph.D.) in Economics from Oxford University where I was a Marshall Scholar. My academic and research specialties are econometrics, the use of statistical models and techniques on economic data, and microeconomics, the study of consumer behavior and the behavior of firms. I teach a course in "Competition in Telecommunications" to graduate students in economics and business at MIT each year. Competition in long distance is one of the primary topics covered in the course. I was a member of the editorial board of the Rand (formerly the Bell) Journal of Economics for the past 13 years. The Rand Journal is the leading economics journal of applied microeconomics and regulation. In December 1985, I received the John Bates Clark Award of the American Economic Association for the most "significant contributions to economics" by an economist under forty years of age. I have received numerous other academic and economic society awards.

3. I have done significant amounts of research in the telecommunications industry. My first experience in this area was in 1969 when I studied the Alaskan telephone system for the Army Corps of Engineers. Since that time, I have studied the demand for local measured service, the demand for intrastate toll service, consumer demands for new types of

telecommunications technologies, marginal costs of local service, costs and benefits of different types of local services, including the effect of higher access fees on consumer welfare, demand and prices in the cellular telephone industry, and consumer demands for new types of pricing options for long distance service. I have also studied the effect of new entry on competition in paging markets, telecommunications equipment markets, and interexchange markets and have published a number of papers in academic journals and books about telecommunications. I have also edited two recent books on telecommunications, Future Competition in Telecommunications (Harvard Business School Press, 1989) and Globalization, Technology and Competition in Telecommunications (Harvard Business School Press, 1993).

4. I have previously provided affidavits to the FCC on competition among long distance providers. I submitted an affidavit to the FCC in November 1993 regarding competition for Basket 1 services in the long distance industry as part of the AT&T dominance proceeding. I also submitted affidavits in 1994 and 1995 on competition among long distance providers to the Department of Justice (DOJ) regarding the waiver request of the Bell Operating Companies (BOCs) to provide cellular long distance and to provide landline long distance service. For this declaration I have updated my analysis by using newly available data from 1997. I have been asked by BellSouth to consider the question of whether consumers would benefit from BOC entry into the residential long distance market and, if so, whether there should be any local competition prerequisite to BOC interLATA entry.

I. Summary and Conclusions

5. BOC entry into long distance will lead to decreased prices and increased competition. BOCs have an economic incentive to offer lower prices than interexchange carriers (IXCs). Market evidence for landline long distance offered by SNET in Connecticut and by GTE elsewhere in the US, demonstrates that prices could well decrease by about 17-18%. Economic benefits to residential customers would be in the range of $6-$7 billion per year.

6. BOC entry into long distance creates incentives for faster local entry, especially by IXCs. All competing carriers will want to offer one-stop shopping, so BOCs and IXCs will compete in both local and long distance markets, if permitted to do so by the Commission. Consumers will benefit from having the option of one-stop shopping for telecommunications services.

II. BOC Entry into Long Distance Will Lead to Lower Prices and Increased Competition

7. Most students of telecommunications agree that customers want some degree of one-stop shopping. AT&T, MCI, and Sprint have all stated publicly that they believe it is important competitively to be able to offer one-stop shopping. BOC entry into long distance will permit the BOCs to offer one-stop shopping to compete with AT&T, MCI, Sprint, Time Warner, and other companies who have publicly announced their future strategy. Increased choices to consumers make them better off, so they will benefit from BOC entry into long distance. Furthermore, market data from the UK and Canada demonstrate that a significant proportion of consumers will choose the one-stop shopping package